Entergy

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Grand Gulf Nuclear Station
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GNRO-2017/00037
August 16, 2017

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Supplemental Licensee Event Report (LER) 2016-005-01, Automatic Reactor SCRAM
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

Attached is Supplemental LER 2016-005-01, Automatic Reactor SCRAM.

This letter contains no new commitments. If you have any questions or require additional information, please contact Douglas Neve at 601-437-2103.

Sincerely,

Douglas Neve
Manager Regulatory Assurance
Grand Gulf Nuclear Station
DAN/ram

Attachment: Licensee Event Report (LER) 2016-005-01

cc: see next page

U.S. Nuclear Regulatory Commission
ATTN: Mr. Siva Lingam
Mail Stop OWFN 8 B1
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

U. S. Nuclear Regulatory Commission
ATTN: Mr. Kriss Kennedy, NRR/DORL (w/2)
Mail Stop OWFN 8 B1
Washington, DC 20555-0001

NRC FORM 366 (04-2017) | U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Grand Gulf Nuclear Station, Unit 1	05000 416	1 OF 3

4. TITLE
Automatic Reactor SCRAM

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									N/A	05000 N/A
06	25	2016	2016	- 005 -	01	8	16	2017	FACILITY NAME N/A	DOCKET NUMBER 05000 N/A

9. OPERATING MODE
1

10. POWER LEVEL
99

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
	☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
Douglas Neve / Manager, Regulatory Assurance	(601) 437-2103

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On June 25, 2016, at 1407 Central Daylight Time, Grand Gulf Nuclear Station was operating in Mode 1 at approximately 98.75 percent rated thermal power, performing final power ascension to 100% power with Reactor Recirculation Flow Control Valves, when an unplanned automatic reactor SCRAM occurred. All safety systems responded per design. Two Safety Relief Valves opened at the onset of the event to control reactor pressure and reseated properly. All control rods inserted when the signals generated by the Reactor Protection System were received. There were no Emergency Core Cooling System actuations. The shift immediately entered the appropriate Off Normal Event Procedures. The plant was stabilized with pressure control on the main turbine bypass valves and level control on the start-up level control valve. The cause of this event was a failed operational amplifier installed on circuit card that provided input to the Turbine Control System Channel 1. Corrective actions include the replacement of the rate limiter circuit cards with re-furbished cards. Future corrective actions will include the implementation of a modification to replace the turbine control system with a digital control system. There were no actual nuclear safety consequences or radiological consequences during the event.

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NARRATIVE

A. PLANT OPERATING CONDITIONS BEFORE THE EVENT

At the time of the event, Grand Gulf Nuclear Station (GGNS) Unit 1 was in Mode 1 and ascending in power at approximately 99 percent (%) rated thermal power (RTP). All systems, structures and components (SSCs) that were necessary to mitigate, reduce the consequences of, or limit the safety implications of the event were available. No inoperable SSCs at the start of the event contributed to the event.

B. DESCRIPTION OF OCCURRENCE

On June 25,2016, at 14:07 hours, during power ascension while at approximately 99% RTP, Turbine Control Valve (TCV) 'B' initiated a Fast Closure followed by TCV 'D' Fast Closure followed by TCV 'C' Fast Closure resulting in actuation of Reactor Protection System (RPS) Divisions 'A' and 'B' causing an automatic full SCRAM signal. All Control Rods fully inserted as required. Reactor power lowered resulting in Generator Power Differential causing a Main Generator Trip.

Reactor Pressure High signal was received and actuated Safety Relief Valves (SRVs) 1B21F051D and 1B21F051B. Both SRVs opened once and re-closed approximately 27 seconds later. No other SRVs actuated and Low-Low Set functioned properly.

Control room personnel entered the appropriate Off Normal Event and Emergency Procedures. The Feedwater Level Control System responded as designed. Reactor level initially lowered below the Level 3 scram setpoint as a result of void collapse and then rapidly rose as feedwater injected. Level stabilized without reaching the Level 8 feedwater trip setpoint. Reactor water level was transferred to startup level control mode. RPS was reset with reactor water level stable on Startup Level Control and reactor pressure stable on Pressure Reference. No Emergency Core Cooling System (ECCS) initiations and no unexpected group isolations occurred as a result of the transient.

C. REPORTABLE OCCURRENCE

This Licensee Event Report (LER) is being submitted pursuant to Title 10 Code of Federal Regulations (10 CFR) 50.73(a)(2)(iv)(A) for an automatic actuation of the reactor protection system (RPS). Telephonic notification was made to the U.S. Nuclear Regulatory Commission (NRC) Emergency Notification System on June 25, 2016, within 4 hours of the event pursuant to 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72 (b)(3)(iv)(A) for a valid RPS actuation while the reactor was critical.

D. CAUSE

The Root Cause for this event was a failed operational amplifier installed on circuit card JC02B350 that provides input to the Turbine Control System (TCS) Channel 1. This resulted in the fast closure of the TCVs and an automatic reactor SCRAM.

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NARRATIVE

E. CORRECTIVE ACTIONS

Immediate:

The rate limiter circuit cards were replaced with re-furbished cards, bench tested cards, and functionally tested cards satisfactorily.

Planned:

Implement a modification to replace the main turbine control system with a digital control system.

F. SAFETY ASSESSMENT

There were no actual nuclear safety consequences or radiological consequences during the event as all systems operated as designed and there was no release of radioactivity.

G. PREVIOUS SIMILAR EVENTS

LER 2015-001-00, Automatic Actuation of the Reactor Protection System (RPS) due to a Fault in the Protective Relaying Circuitry on the "B" Main Transformer

LER 2016-001-01, Valid Engineer Safety Feature Actuation and Temporary Loss of Residual Heat Removal

LER 2016-002-00, Automatic Actuation of the Reactor Protection System due to 'B' Main Transformer Wiring

LER 2016-004-00, Automatic Reactor SCRAM During Turbine Stop and Control Valve

LER 2016-006-01, Multiple Valid Engineered Safety Feature Actuations

Entergy reviewed above described events and determined that the corrective actions associated with the events and the corrective actions could not have prevented this event.